Feature Selection with Cost Constraint

Emergent Research Forum Paper

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Abstract

When acquiring consumer data for marketing or new business initiatives, it is important to decide what features of potential customers should be acquired. We study feature selection and acquisition problem with cost constraint in the context of regression prediction. We formulate the feature selection and acquisition problem as a nonlinear programming problem that minimizes prediction error and number of features used in the model subject to a budget constraint. We derive the analytical properties of the solution for this problem and provide a computational procedure for solving the problem. The results of a preliminary experiment demonstrate the effectiveness of our approach.

Keywords

Feature selection and acquisition, linear regression, optimization, Lasso.